DOCUMENT RESUME

ED 191 267 FL 011 240

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TITLE Success or Failure: Does It Affect Young Children's Request Strategies? Papers and Reports on Child Language Development, No. 17.
INSTITUTION Stanford Univ., Calif. Dept. of Linguistics.
PUB DATE 79
NOTE 9p.

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Child Language: *Communication Skills: *Language Acquisition: Language Research: Longitudinal Studies: Need Gratification: Psycholinguistics: *Speech Communication: Speech Habits: *Verbal Development: Young Children

ABSTRACT

The ability of young children to communicate at the time they produce their first words was studied, with particular reference to the question of whether children are able to modify their requests depending on the adult's response. The subjects were four children ranging in age from 15 to 18 months; the data were their requests of adults coded from videotape recordings of each subject at free play with the experimenter and the mother when she desired. The sessions took place over a period of eight months. An analysis of the requests made of adults by the subjects revealed sequences of requests in which each request had the same goal. Two predictions were made: (1) change was expected more often when an initial request met with failure than when one met with success: and (2) any changes occurring in sequences involving success were expected to be reductions in behaviors used to make the request initially whereas changes in sequences involving failure would be more likely to be additions and/or substitutions of new behaviors. These predictions were confirmed. Data suggesting that the differences in the kind of changes made reflected knowledge of listener needs proved difficult to interpret and point the way to further research. (AMH)

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ED191267

PRCLD #17 (1979)

SUCCESS OR FAILURE: DOES IT AFFECT YOUNG CHILDREN'S REQUEST STRATEGIES?

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This is a study of the abilities of young children to communicate at the time they produce their first words. The production of first recognizable words is generally regarded as a milestone in the development of language. However, even before they reach this milestone, children use nonverbal and vocal strategies to accomplish many of the same goals they will come to accomplish with language. Because what children know about communicating in general may help them learn how to use language in particular, study of communication abilities at this point in development should prove useful to students of language development as well as to students of communication skills in general.

At the time children produce their first words, a large portion of their communications with adults consists of nonverbal behaviors and vocalizations performed in order to request that adults do something. Are these children able to modify their requests depending on the adult's responses? This is the question addressed in this research. An analysis of the requests made of adults by the subjects in a longitudinal study of single-word utterance speech revealed sequences of requests in which each request had the same goal. Such sequences occured both when the initial request failed and when it succeeded in eliciting the desired response from the adult. Sometimes when the initial request failed, the child persisted in attempting to elicit the desired behavior. Other times, the initial request succeeded in eliciting the desired response, and the child wanted an immediate repetition of the interesting and/or important behavior. Thus the strategies a child used in an initial request could be compared to those used in the next request in a sequence both in response to success and in response to failure of the initial request.

Two predictions were made specifying the changes expected if the children in the study were indeed modifying their request strategies on the basis of listener response. First, change was expected more often when an initial request met with failure than when one met with success. Secondly, any changes that did occur in sequences involving success were expected to be reductions in behaviors used to make the request initially, whereas changes occuring in sequences involving failure would be more likely to be additions and/or substitutions of new behaviors. It seemed logical that once a request had been successful, a duplication or even an abbreviation of this request should have been sufficient to make the adult repeat the action. When the adult had not responded satisfactorily, more information was necessary, or that information already provided should have been provided in a clearer, more compelling manner.

FL011240

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Subjects

Four children ranging in age from 15 to 18 months at the beginning of the study were subjects. They were among the subjects in a longitudinal study of the development of single-word utterance speech. They were all first born and they were found in an informal way through the experimenter's friends and neighbors.

According to mother's reports, Alyssa, Gregory, Jonathan and Michael had begun saying clearly recognizable words just shortly before the first data collection session. They reached varying degrees of proficiency with multi-word utterances by the end of the study. Alyssa produced only 4 words during her first session. In her last session, she said 40 single-word utterances but only 3 word combinations. Gregory produced 29 single-word utterances in his first session and 2 combinations. By the end of the study, he spoke primarily in multi-word utterances. Jonathan said only one word during his first session. By the end of the study, he used single-word and multi-word utterances with about equal likelihood. Michael produced 5 words in his first session and used both single-word and multi-word utterances in his last session though single-word utterances sill predominated.

Method

The data were children's requests of adults coded from videotape recordings of each subject at free play with the experimenter and the mother when she desired. Such recordings were made at each session of the longitudinal study of single-word utterance speech in which these subjects took part. Sessions took place in the child's home once a month for eight months. The recordings were half an hour long. Props for free play included a set of toys that the experimenter brought in addition to the child's own things.

The requests were coded according to a system developed for the study of single-word utterance speech and reported in detail in Haselkorn, 1977. Several things were noted about each request. This information was the starting point for the coding and analysis necessary to answer the question central to the research reported here. First, the behavior that the child visibly directed to the adult was coded according to the kind of information it provided about the request being made. Four kinds of information were found necessary to understand that a request had been made and what was requested: 1. information that something is wrong; 2. information about which objects are involved; 3. information about what will solve the problem, and 4. information that the adult is to participate in the solution. Secondly, the context of the request, both the immediate and distant past history of the adult-child interaction was also noted according to the kind of information it provided about the request being made. The same four categories of information were used. Third, the goal of the request was noted in the form 'Child wants Adult to (action) the (object/s).' Requested actions included the transference of possesions of objects, performance of some

action on objects and giving information about objects. Fourth, each request was classified according to whether or not it was part of a "request sequence." When the goal of two or more requests in succession was the same, the group of requests was designated as a request sequence. Intercoder reliability of this classification was calculated by Cohen's K; it was significant ($K = .8$, $p < .001$). A consensus was reached on all codes by the experimenter and a graduate student research assistant.

The coding of a request as standing alone or as part of a sequence was done without regard to the adult's response to any request. This information was added for purposes of the study reported here. The naturally occuring sequences found in the data were divided into pairs of consecutive requests; the second request of the first pair was the first request of the second pair. These pairs of consecutive requests constituted the basic unit of analysis for the research reported here. If the adult complied with the first request in a pair, the pair was considered a "success sequence." If the adult did not comply with the first request of a pair, the pair was considered a "failure sequence." The adult's reason for not complying was not considered. Not included in the analyses were cases in which the adult performed some action in response to a request, but where the goal of the request was not clear enough to the observers to allow a judgment as to whether or not the adult was complying.

The predictions outlined above concerned the nature of changes in strategies from the first request in a pair to the second. For both "success" and "failure" sequences, each request was compared to the request immediately preceding it, and any changes in the child's behavior were noted. Figure 1 illustrates the kind of changes made both in success and failure sequences. Alyssa omitted the vocalization and added the words "Blow, blow" which were scored as an indication of what will fix the problem. Also, the proximal indication of the balloon was changed to a distal one and there was no extension of the balloon to the adult in the second request. This was probably because the adult was now holding the object (see "Adult's response to initial request") and, so, was not counted as a "change" for scoring purposes. Gregory got the response he wanted from the adult and liked the phenomena so much he asked for an immediate repetition. Comparing the initial request with the request for repetition, one notices several changes. Greg added a jerky body motion to his initial request. (See "Indication that something is wrong") Instead of the proximal indication of the object involved, holding the lid, Greg only gazed at the box. Finally, eye contact, the indication that the adult should participate, was omitted in the second request. Had the children's behavior in the second request of each of these pairs been identical with the behavior in the initial request, they would have been scored as "failure sequence, without change" and "success sequence, without change," respectively.

To confirm the first prediction that if children were modifying their requests on the basis of listener response, they would make changes in failure sequences more often than in success sequences, Table 1 was constructed. Any sequence that contained a change in the

Figure 1. Examples of success and failure sequences with change.

Failure Sequence With Change
Goal: Alyssa wants E to blow up balloon
Adult's Response to Initial Request: A. says "What do you want?" Takes balloon Alyssa is holding out to her.

		Indicates Something is Wrong			Indicates Objects Involved		Indicates What Will Fix It		Indicates Adult is to Participate	
		V	VOC	NV	V	NV	V	NV	V	NV
Child's Behavior in Making Request	Initial Request		X	Open Pos.		balloon-proximal (hold)				eye contact extend obj.
	Next Request					balloon-distal (gaze)	blow	blow		eye contact

Success Sequence With Change
Goal: Gregory wants E to make man in popbox come up
Adult's Response to Initial Request: Squeezes bulb to make man come up saying, "Peek-a-Boo."

		Indicates Something is Wrong			Indicates Objects Involved		Indicates What Will Fix It		Indicates Adult is to Participate	
		V	VOC	NV	V	NV	V	NV	V	NV
Child's Behavior in Making Request	Initial Request		X			popbox-proximal (hold lid)				eye contact
	Next Request		X	jerky body motion		popbox-distal (gaze)				

child's requesting behavior appeared in this table. As can be seen from Table 1, these children were indeed making changes more often in failure sequences than in success sequences. For example, the first line of the table provides information about Alyssa's first session. 43%, or 3 out of 7 success sequences found in this session included a changes from the initial request to the next request in the sequence. However, 100%, in this case, 1 out of 1, of the failure sequences contained such change. In each session, for each child, the percentage of failure sequences that included some change was as great and, most often, greater than that found in success sequences. A one-tailed t test for matched pairs

was performed on the proportions in this table. The proportion of change for success and failure sequences, respectively, for each child was based on the requests from all sessions combined. The greater proportion of change found in failure sequences was found to be significantly different than chance at the $p < .01$ level. This was true for proportions based on raw data as well as for arcsine-transformed proportions. ($t = 7.308$, raw data; $t = 4.826$, arcsine-transformed data) An unexpected finding was that the percentage of success sequences with changes increased over time for each child.

Table 1. A comparison of the percentage of success and failure sequences that included a change in the child's strategies from the initial request to the request immediately following in the sequence.

Subject	Session	Success Sequences % (n of total	Failure Sequences no. of sequences)
Alyssa	I	43% (3 of 7)	100% (1 of 1)
Alyssa	V	40% (2 of 5)	70% (7 of 10)
Alyssa	VIII	64% (9 of 14)	89% (8 of 9)
Gregory	I	45% (5 of 11)	100% (3 of 3)
Gregory	IV	57% (4 of 7)	100% (6 of 6)
Gregory	VIII	60% (9 of 15)	100% (7 of 7)
Jonathan	I	25% (2 of 8)	100% (1 of 1)
Jonathan	V	100% (2 of 2)	100% (2 of 2)
Jonathan	VIII	100% (3 of 3)	100% (2 of 2)
Michael	I	45% (5 of 11)	82% (9 of 11)
Michael	IV	67% (4 og 6)	100% (13 of 13)
Michael	VIII	80% (4 of 5)	100% (9 of 9)

To confirm the second prediction that reductions would be more likely in success sequences while additions and/or substitutions would be more likely in failure sequences, Table 2 was constructed. All three sessions for each child were combined because of the small frequencies of sequences. Only the data from Gregory showed clear support for the second prediction. More than half of the changes he made in success sequences were reductions compared to only a quarter of the changes in his failure sequences. Jonathan's data supported the prediction in that the percentage of changes that were reductions in success sequences was higher than in failure sequences, but additions and/or substitutions were more likely than reductions in either sequence type. Alyssa's data did not support the prediction, and Michael's data clearly violated it. The greater proportion of reductions found in success sequences was not significantly different from chance as calculated by the t test for matched pairs ($t = 1.40$, raw data; $t = 1.215$, arcsine-transformed data).

Table 2. A comparison of the frequency with which reductions and additions and/or substitutions were used to change initial requests in success and in failure sequences. All sessions combined for each child.

	Success Sequences			Failure Sequences		
Subject	Reductions	Additions & Substitutions	Total	Reductions	Additions & Substitutions	Total
	N (row percentage)			N (row percentage)		
Alyssa	7(37%)	12(63%)	19	9(30%)	21(70%)	30
Gregory	10(57%)	6(43%)	14	4(25%)	12(75%)	16
Jonathan	5(40%)	6(60%)	10	1(17%)	5(83%)	6
Michael	4(12%)	14(88%)	16	7(23%)	24(77%)	331

When the second prediction was not clearly confirmed, a more fine-grained analysis was made of the types of reduction, additions and substitutions that were used in each kind of sequence. Reductions and additions were divided into categories depending on the type of information omitted or added. Where possible, substitutions were divided into those resulting in more explicit or less explicit indications of any type of information. Because of the proliferation of categories needed in this more fine-grained analysis, the data from all of the children were combined. The resulting lack of independent observations in the tables ruled out statistical testing of any differences in proportions. Nevertheless, any large differences in the proportions with which certain reductions, additions or substitutions were made in success sequences as opposed to failure sequences could be taken as evidence that these subjects acted differently in response to success rather than failure. This would be specially true if the different types of changes used in the two sequence types made sense in terms of the requirements of the listener. Such findings would be useful in formulating hypotheses for further research in which larger data bases would allow for statistical tests of differences.

The results of these fine-grained analyses were as follows. The proportion of reductions made in success sequences minus the proportion of reductions made in failure sequences for each type of information coded were something wrong - 16%, object involved - 5%, what will fix it - 14%, adult to participate - 35%. The frequency with which the children left out indications that the adult should participate in success sequences was far greater than in failure sequences. Presumably, once children successfully elicit some adult action, the adult's participation in an immediate repetition of the action is understood, and another explicit indication that the adult is to participate is unnecessary.

The corresponding differences in proportions with which certain types of information were added in success sequences as opposed to failure sequences were something wrong - 10%, object involved - 11%, what

will fix it -33%, adult to participate-11%. The children added indications of what will fix their problem 33% more often in failure sequences than in success sequences. If a listener does not do what a speaker desires with just the context of the request to go on, adding some indication of what is to be done to the request should increase the speaker's chances of success.

With regard to substitutions, it seemed logical that an increase in explicitness should follow failure more often than success. 76% of the subsitutions found in failure sequences were substitutions of more explicit indications, 24% went the other way. In contrast, in success sequences, both types of substitutions seemed equally likely: 56% were more explicit and 44% were less explicit.

Conclusions

Are children just beginning to produce recognizable words, able to modify their requests in terms of listener response? Clearly the children in this study did behave differently in the face of failure than they did in the face of success. When an initial request failed, they changed it; when an initial request succeeded, they tended to repeat it exactly (although, over time, they became more and more likely to change these requests too). Can it be said, however, that these changes were motivated by knowledge of the listener's requirements? Is there any basis for arguing that the child's behavior is more than the maintenance of rewarded behavior and the change of the unrewarded?

On the basis of the results of the fine-grained analyses of the types of changes the children made in success and failure sequences, one could say that the children seemed to be operating on the basis of rules like the following: 1. if a request succeeds, optionally leave out indications that the adult should participate when requesting immediate repetitions; 2. if a request fails, add some explicit information about what is wanted; and, 3. if a request fails, make relatively inexplicit indications of information more explicit. But what does an indication that children operate according to such rules mean? Even as adults, we sometimes make discriminating responses in some areas of our lives - that is, we look as if we know what we are doing - when we do not really fully understand why what we do works. Young children are probably in this situation often. Certainly, clear evidence is needed for adopting the stronger claim that the young children studied here made changes motivated by an understanding of the listener's needs.

The unexpected finding that children are increasingly likely to change successful requests is a strong indication that something more is going on than maintenance of rewarded strategies and change of unrewarded ones. Some evidence has been presented that does suggest some things the children may have been coming to know about the listener's requirements. However, this evidence should be interpreted cautiously. Of course, the usual caveats of much of child language research hold here: small number of subjects, low frequencies of variables, relatively untested coding systems. But, there are additional reasons for concern.

First of all, even the most striking differences between the types of changes made in success sequences as opposed to failure sequences were between relatively large and small percentages. They are not differences that clearly characterize one type of sequence while not occuring at all in the other type. Also, the reasonableness of these relatively large differences in frequency, where they did occur, was explained post hoc. Secondly, the force of these findings was weakened by the need to combine the data from all of the children, thereby eliminating the possibility of replicating findings concerning one child in the data of the other children.

Third, in sequences that were naturally longer than two requests, a particular behavior in R_i that changes in R_{i+1} sometimes reoccured in R_{i+2}. For example, Michael might have indicated what would fix his problem with a gesture; when the request failed, he might have persisted with a more explicit indication. But when this, too, failed, he might have again used the gesture in the next request in the sequence. Such behavior looks like change for its own sake and not change in light of knowledge about which indication is more likely to satisfy the listener's needs. Finally, in some of the most complicated requests, often dealing with things not physically present, it looked as though the child's persistent efforts were aimed only at motivating the adult to keep trying to figure out what was wanted rather than directly providing as explicit an indication as possible of what was to be done.

In conclusion, the method used here - studying children's communication acts as they appear in the naturally occuring stream of interaction rather than as single events each comparable to any other - proved useful in tackling a question of young children's communicative competence. Children who are beginning to say recognizable words do modify their requests on the basis of success or failure <u>in some way</u>. The most global difference, that change of any kind is more likely in failure sequences than in success sequences, was the most unequivocal finding. The data suggesting that the differences in the kind of changes made reflected knowledge of listener needs were more difficult to interpret for the reasons outlined. These reasons point the way to further research.

Footnotes

1. The research reported here was supported in part by NSF Dissertation Grant SOC 75 05642.

References

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